REMARKS

Claims 1-10 and 22-31 were presented for examination in the present application. The instant amendment adds new claims 32 and 33. Thus, claims 1-10 and 22-33 are presented for consideration upon entry of the instant amendment. Claims 1, 10, and 22 are independent.

Claims 22-31 have been allowed.

Applicants acknowledge the withdrawal of the rejection to claims 1-10 under 35 U.S.C. §103(a) over Japanese Publication No. 11-157939 to Hirao et al. (Hirao) in view of U.S. Publication No. 2002/0106611 to Bhaduri et al. (Bhaduri).

The Office Action now rejects claims 1-10 under 35 U.S.C. §103(a) over newly cited U.S. Patent No. 4,810,846 to Holcombe et al. (Holcombe) in view of Bhaduri.

Applicants respectfully traverse these rejections.

Independent claim 1 recites, in part, the step of "introducing, via said microwaves, sintering energy into the materials to be sintered via **electromagnetic waves in the range of vacuum wavelengths between 5 cm – 20 cm in multimode** having an electromagnetic power of up to one kilowatt (emphasis added)".

The Office Action acknowledges that Holcombe does not show the wavelength and power of the microwave energy used. Rather, the Office Action asserts that Bhaduri shows microwave sintering of dental parts with a wavelength of 12.5 cm and a power of 1.0-2.5 Kw. The Office Action asserts that it would have been obvious to one skilled in the art to modify Holcombe to determine the exact frequency and power in view of Bhaduri through routine experimentation.

The question of obviousness is resolved on the basis of underlying factual determinations including (1) the scope and content of the prior art, (2) any differences between the claimed subject matter and the prior art, (3) the level of skill in the art, and (4) where in evidence, so-called secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966). See also *KSR International Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1734 ("While the sequence of these questions might be reordered in any particular case, the [*Graham*] factors continue to define the inquiry that controls.")

Applicants respectfully submit that the Office Action has failed to meet its burden of establishing a *prima facie* case of obviousness because the Office Action has failed to determine the level of skill in the art.

Furthermore, Applicants submit that one skilled in the art would simply never look to modify Holcombe in view of the teachings of Bhaduri because Bhaduri is **non-analogous art** as to the present application

In order to rely on a reference as a basis for rejection of an applicant's invention, the reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned." *In re Oetiker*, 977 F.2d 1443, 1446, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992). See also *In re Deminski*, 796 F.2d 436, 230 USPQ 313 (Fed. Cir. 1986); *In re Clay*, 966 F.2d 656, 659, 23 USPQ2d 1058, 1060-61 (Fed. Cir. 1992) ("A reference is reasonably pertinent if, even though it may be in a different field from that of the inventor's endeavor, it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering his problem."); *Wang Laboratories Inc. v. Toshiba Corp.*, 993 F.2d 858, 26 USPQ2d 1767 (Fed. Cir. 1993).

Applicants submit that Bhaduri is non-analogous art to Holcombe and to the claimed invention such that the proposed combination of cited art fails to disclose or suggest claim 1.

Claim 1 is directed to a method for manufacturing **ceramic parts** with a certain porosity by sintering using microwaves.

In contrast, Bhaduri is directed to the microwave sintering of a **metal part**. Specifically, Bhaduri discloses a structure that is obtained by pressing and subsequently densifying commercially pure **titanium powder**. Although the process will be described with reference to the fabrication of the screw shaped titanium dental implant shown in FIG. 6, the process may be used to produce other shapes and **with other metallic powders**. Titanium powder is green compacted at about 20 Ksi in a mold of the desired size and shape in a cold isostatic press. **See** paragraph [0035].

Applicants submit that sintering of metals as in Bhaduri can not reasonably be considered to be in the field of endeavor of sintering ceramics as in claim 1.

Even if one were to consider "microwave sintering" generally to be a broad field of endeavor such that Bhaduri and claim 1 were to be in the same field of endeavor, Applicants submit that the microwave sintering of metals as in Bhaduri does not deal with subject matter that logically would have commended itself to an inventor's attention when considering the problems of microwave sintering of ceramics.

It is commonly known, and Bhaduri specifically discloses, that due to the high electrical and thermal conductivity of metallic powders the microwaves are coupled within the part. **See** paragraph [0032]. However, Applicants submit that such a coupling of microwaves does not occur with ceramics as in claim 1 such that one skilled in the art would simply not look to Bhaduri, particularly when trying to determine the optimum microwave frequency and power to apply as was asserted by the Office Action.

Accordingly, Applicants respectfully submit that one looking to resolve the problems associated with the manufacturing of ceramic parts with a certain porosity by sintering using microwaves as in claim 1 would simply never look to Bhaduri, which

merely discloses sintering of metallic materials.

Thus, Applicants submit that Bhaduri is non-analogous art to such that the proposed combination of cited art fails to disclose or suggest claim 1.

Moreover, Applicants submit that the method recited by claim 1 does much more than yield predictable results. Specifically, the method recited by claim 1 provides ceramic parts with a certain porosity by sintering using microwaves, a result that simply can not be predicted by one skilled in the art viewing the collective teachings of the cited references.

In sum, Applicants submit that the Office Action has failed to establish a *prima facie* case of obviousness by failing to establish the skill in the art, has used non-analogous art in its rejection, and has failed to establish or even assert that the combination recited by claim 1 does not produce new and unpredictable results. As such, Applicants submit that claim 1, as well as claims 2-9 that depend therefrom are allowable over the proposed combination of cited art. Reconsideration and withdrawal of the rejection to claims 1-9 are respectfully requested.

Claim 9 is also believed to be in condition for allowance. Claim 9 recites that the materials to be sintered is selected from the group consisting of Al_2O_3, Spinell, Ce- or Y-stabilized ZrO_2, and mixtures thereof.

Applicants respectfully submit that the Office Action has failed to meet its burden of establishing a *prima facie* case of obviousness because the Office Action has failed to assert that any of the cited references disclose or suggest the claimed materials to be sintered.

Similar to claim 1 discussed in detail above, independent claim 10 is directed to a method of "manufacturing full ceramic dental restorations from **dental ceramic masses** with a certain porosity by **sintering using microwaves**", including the step of

"introducing, via said microwaves, sintering energy into said ceramic masses to be sintered via electromagnetic waves in the range of vacuum **wavelengths between 5 cm – 20 cm in multimode having an electromagnetic power of up to one kilowatt**".

Again, Applicants maintain that the Office Action has failed to establish a *prima facie* case of obviousness with respect to claim 10 by failing to establish the skill in the art. Further, Applicants maintain that the microwave sintering of Bhaduri is non-analogous to the microwave sintering of dental ceramic masses as in claim 10 such that the proposed combination of Holcome and Bhaduri fails to disclose or suggest claim 10. Moreover, Applicants maintain that the microwave sintering of dental ceramic masses as in claim 10 produces new and unpredictable results that simply can not be predicted by one skilled in the art viewing the collective teachings of the cited references.

Accordingly, claim 10 is not disclosed or suggested by the cited art. Claim 10 is therefore believed to be in condition for allowance over the cited art. Reconsideration and withdrawal of the rejection to claim 10 are respectfully requested.

Claims 32-33 have been added to point out various aspects of the present application. It is submitted that new claims 32-33 are directed to the elected method. Support for new claims 32-33 can be found in the specification at least at page 2, lines 19-24. No new matter is added.

Applicants specifically point out that new claims 32-32 are not intended to be limited to the specific mechanisms of patentability previously argued with respect to any prior claims in this or any related applications. Accordingly, Applicants hereby rescind any disclaimer of claim scope and, thus, any prior art for which such a disclaimer was made to avoid may need to be revisited by the Examiner with respect to new claims 32-33.

Claims 32-33 are in a condition for allowance. For example, claims 32 and 33 each recite, in part, that "the second material is characterized by **partial absorption** of

the electromagnetic waves and a **partial transparency** to the electromagnetic waves".

Bhaduri discloses no vessel at all, while Holcombe discloses a container 22 that is provided with vertically extending sidewalls 28, which are formed of a material essentially **opaque to microwave radiation** so as to **reflect the microwaves back into the chamber** and retain the microwave radiation within the chamber 30. **See** col. 3, lines 57-67.

Clearly, the sidewalls 28 of Holcombe, which **reflect radiation**, fail to disclose or suggest the claimed second material that is characterized by **partial absorption** of the electromagnetic waves and a **partial transparency** to the electromagnetic waves of claims 32 and 33.

Accordingly, claims 32-33 are each in condition for allowance over the proposed combination of Bhaduri and Holcombe.

In view of the above, it is respectfully submitted that the present application is in condition for allowance. Such action is solicited.

In addition, Applicants submit that the Office Action failed to make a *prima facie* case of obviousness of claims 1, 9, and 10 in view of the cited art. Thus, it is respectfully submitted that any action finally rejecting claims 1-10 over the cited art alone would be premature in light of the Office Action's failure to present a *prima facie* case of obviousness.

If for any reason the Examiner feels that consultation with Applicants' attorney would be helpful in the advancement of the prosecution, the Examiner is invited to call the telephone number below.

Respectfully submitted,

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